National Institute of Environmental Health Sciences

The role of proteomics in the study of the influence of climate change on seafood products

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Abstract:

The climate change influence over the oceans has been the subject of numerous articles informs and strategies from different scientific perspectives, focused mainly in the ecological impact. The majority of the related studies have been focused in measuring or predicting the physical, chemical, geographical, sociological and economical consequences of this reality, which seems to be unstoppable, and only a few of them are devoted to detect the effects of the climate change over the quality of seafood products, wild or cultivated. The stress produced in marine organisms by the consequences of climate change is reflected at the cell molecular level, being affected the metabolite concentration, the expression of proteins and their modifications. The study of the climate change may take advantage of these molecular changes, which may be used as a source of possible biomarkers of its evolution. After the genomic age, proteomics appears as a young but robust discipline for a global study of the protein content in cells, including their identification, possible modifications, quantification of differential expression and tissue localization, being the most adequate set of methodologies to evidence protein changes in marine organisms affected by climate variations. In the last decade proteomic technologies have experienced an exponential development, but the research has been mainly applied to biomedical and human health research, being scarcely focused to the study of the marine environment. The application of the proteomics methods to study the effects of climate change over seafood, mainly from the safety point of view, is reviewed.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Food/Water Quality, Food/Water Quality, Food/Water Security, Sea Level Rise, Temperature

Food/Water Quality: Biotoxin/Algal Bloom, Biotoxin/Algal Bloom, Chemical, Chemical, Chemical, Pathogen, Other Water Quality Issue

Water Quality (other): Dissolved oxygen levels; Ocean temperature; Salinity; Acidity; Nutrients

Food/Water Security: Fisheries, Food Access/Distribution, Nutritional Quality, Other Marine Productivity

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Freshwater, Ocean/Coastal

Geographic Location: ☑

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

General Health Impact

Resource Type: ☑

format or standard characteristic of resource

Research Article, Review

Timescale: ☑

time period studied

Time Scale Unspecified